REMARKS

Claims 1-20 and 22-23 are cancelled. Claims 21 and 24-37 are all the claims pending in the application.

Support for new claims 26-37 is found in original claims 21, 24 and 25 and in the specification at page 22 and at pages 43-45, 71 and 72. No new matter is added.

Detailed Action

Priority

Benefit has been claimed to prior filed Nonprovisional Application No. 09/324,910.

The Examiner is thanked for bringing this matter to the applicants' attention.

Claim Rejections - 35 U.S.C. § 112

A. In the paragraph bridging pages 3 and 4 of the Office Action, the Examiner rejected claims 21 and 24-25 under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner stated that it is not clear whether the peptide bonds and the cross-linking referred to in the claims relate to the protein that is being modified or some other protein.

Applicants advise that the peptide bond and the cross-linking referred to in the claims pertains to the protein or peptide being modified. Accordingly, claims 21 and 24-25 have been appropriately amended for purposes of clarification only.

B. From the first full paragraph at page 4 of the Office Action to the second full paragraph at page 6 of the Office Action, the Examiner rejected claims 21 and 24-25 under 35 U.S.C. § 112, first paragraph. The Examiner asserted that the application does not enable a method using any deamidating enzymes from any source. The Examiner stated that the

deamidating activity appears to be unique to the enzyme having SEQ ID NO: 6. The Examiner further stated that one skilled in the art would not be able to make or find every possible enzyme that could be used in the method of claims 21 and 24-25.

For the following reasons, the rejection is traversed, respectfully:

The specification provides a detailed description of where to find organisms that have the enzyme, how to grow the organisms, and how to isolate enzymes that meet the recitations of the claims.

Specifically, the instant specification fully and adequately describes methods for screening microorganisms capable of producing protein-deamidating enzyme (see page 20, line 12 to page 21, line 2), culturing methods thereof (see page 21, line 3 to page 22, line 2; page 20, lines 7-26), methods for isolating and purifying the protein-deamidating enzyme (see page 24, line 15 to page 26, last line), methods for measuring protein-deamidating activity (see page 21, line 4 to page 30, line 2), and methods for confirming the physiochemical properties of the protein-deamidating enzyme (see page 30, line 2 to page 33, line 3).

In addition, the specification teaches that the protein-deamidating enzyme of the present claimed invention can also be obtained from microorganisms by utilizing the hybridization method or the PCR method using the entire portion or a part of the protein-deamidating enzyme gene from *Chryseobacterium gleum* JCM 2410 as a probe or as primers. The detailed methods for the hybridization and PCR are described from page 48, line 20 to page 51, line 17 of the instant specification.

Accordingly, in view of the disclosure in the instant specification including guidance and Examples therein, applicants respectfully submit that it is possible for one of ordinary skill in the

art to conduct isolation, purification and characterization of the enzyme without undue experimentation. Hence, applicants respectfully submit that the rejection has been overcome.

In view of the above, The Examiner is requested, respectfully, to reconsider and remove the rejection.

The Examiner's attention is also directed to new claims 26-37.

In this respect claims 26, 30 and 34, recite that the enzyme is derived from a *Chryseobacterium.* The Examiner's attention is directed to pages 30 to 33 of the specification. These pages describe numerous physical characteristics of a preferred embodiment of the enzyme when derived from *Chryseobacterium.* Specifically, the physiochemical properties of molecular weight, optimum pH, optimum temperature, stable pH, stable temperature, and isoelectric point of the enzyme derived from *Chryseobacterium* sp. No. 9670 are described.

In addition, claims 27-29, 31-33 and 35-37 recite several physical characteristics of the enzyme.

Also note that claims to the enzyme, as characterized in method claims 27-29, 31-33 and 35-37, are present in U.S. Patent No. 6,251,651.

C. In the paragraph bridging pages 6 and 7 of the Office Action and the first and second full paragraphs at page 7 of the Office Action, the Examiner rejected claims 21 and 24-25 under 35 U.S.C. § 112, first paragraph. The Examiner asserted that applicant has not provided a sufficient number of specific enzymes in order to be able to formulate a genus.

In response, applicants respectfully submit that the Examiner is being too restrictive. Applicants have shown in the Examples that many strains of *Chryseobacterium,* other than *Chryseobacterium gleum* JCM 2410, produce a protein deamidating enzyme. (See Example 4)

At page 24, first full paragraph, applicants also state that the inventive enzyme can be distinguished from known transglutaminases, because it does not have activity to hydrolyze peptide bonds and because it does not have activity to catalyze the formation of isopeptides between glutamine residues and lysine residues in protein.

The Examiner has not given any reason to doubt applicants' disclosure as supported by the examples.

Thus, applicants submit that the enzyme that is recited in the amended claims is supported by a written description thereof in the specification.

Claim Rejections - 35 U.S.C. § 102

In the first full paragraph at page 8 of the Office Action, the Examiner rejected claim 21 under 35 U.S.C. § 102(a) as being anticipated by *Yamaguchi et al.* (Appl. Environ. Microbiol., 8/2000, Vol. 66(8):3337-3343), and in the second full paragraph at page 8 of the Office Action, the Examiner rejected claims 21 and 24-25 under 35 U.S.C. § 102(a) as being anticipated by *Yamaguchi et al.* (EP 0976829 A2, 2-2000).

Both of these references have publication dates (August 2000 and February 2, 2000, respectively) after applicant's priority date of December 3, 1999. Accordingly, submitted herewith is a sworn translation of the priority document, establishing that applicants were in possession of the invention prior to the publication dates of the cited references. Thus, the Examiner is requested to reconsider and remove the rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

Susan J. Mack

Susan J. Mack
Registration No. 30,951

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

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PATENT TRADEMARK OFFICE

Date: February 13, 2003

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1-20 and 22-23 are canceled.

Claims 26-37 added as new claims.

The claims are amended as follows:

21. A method for modifying a protein or a peptide, which comprises reacting~~allowing~~ an enzyme with the protein or peptide, wherein the enzyme has ~~having an~~ activity to deamidate amido groups in the protein or the peptide by directly acting upon the groups without causing severing of peptide bonds in the protein or peptide, or ~~and~~ cross-linking of the protein or peptide~~to react with a protein or a peptide~~.

24. A method for improving functionality of a plant or animal protein and/or peptide, which comprises reacting~~allowing~~ an enzyme with the protein or peptide, wherein the enzyme has ~~having an~~ activity to deamidate amido groups in the protein or the~~and~~ peptide by directly acting upon the groups without causing severing of peptide bonds in the protein or peptide, or ~~and~~ cross-linking of the protein or peptide~~ to react with the protein and/or peptide~~.

25. A method for improving functionality of food containing a plant or animal protein and/or peptide, which comprises allowing an enzyme to react with the food, wherein the enzyme has ~~having an~~ activity to deamidate amido groups in the protein or the~~and~~ peptide by directly acting upon the groups without causing severing of peptide bonds in the protein or peptide, or ~~and~~ cross-linking of the protein or peptide~~ to react with the food~~.